DOCUMENT RESUME

ED 150 078 SO 010 681

AUTHOR Stokes, Bruce
TITLE Local Responses to Global Problems: A Key to Meeting Basic Human Needs. Worldwatch Paper 17.
INSTITUTION Worldwatch Inst., Washington, D.C.
PUB DATE Feb 78
NOTE 62p.
AVAILABLE FROM Worldwatch Institute, 1776 Massachusetts Avenue, N.W., Washington, D.C. 20036 ($2.00, paper cover)

EDRS PRICE MF-$0.83 Plus Postage. HC Not Available from EDRS.
DESCRIPTORS *Action Programs (Community); *Citizen Participation; Cooperation; Developed Nations; Developing Nations; Economic Factors; Financial Needs; Financial Support; *Global Approach; Housing Patterns; *Human Living; International Organizations; Medical Services; Needs; Problem Solving; *Productive Thinking; Quality of Life; Resource Allocations; Social Action; Social Factors; Social Responsibility; Sociocultural Patterns; Socioeconomic Influences; Success Factors; World Affairs; *World Problems

ABSTRACT

The booklet maintains that the key to meeting basic human needs is the participation of individuals and communities in local problem solving. Some of the most important achievements in providing food, upgrading housing, improving human health, and tapping new energy sources, comes through local self-help projects. Proponents of local efforts at world problem solving point out that national and international efforts are too highly centralized to encourage direct action by those who are most affected. Examples of problem-solving achievements by local initiative include private-plot agriculture in socialist countries; prefabricated housing in industrial nations; solar heating in Chinese villages; and self health care in industrial and Third World nations. Cooperation of national and international agencies with community organizations can be effective if they combine local initiative with long-term financing for specific projects. Examples of successful cooperation include the World Bank Urbanization Project (which provided $866 million to 15 developing nations between 1972-77 for housing), and the local development project of the Inter-American Foundation (which distributed $40 million between 1971-76 to Latin American citizens groups for agricultural and housing improvements). The conclusion is that local participation in social reform offers individuals the opportunity to understand and develop administrative and organizational skills to deal with both immediate and long-term needs. (Author/DB)

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Local Responses to Global Problems: A Key to Meeting Basic Human Needs

Bruce Stokes

SP 010 681

Worldwatch Paper 17
February 1978

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Library of Congress Catalog Card Number 77-94930
ISBN 0-916468-16-X

Printed on recycled paper

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Introduction

The key to meeting basic human needs is the participation of individuals and communities in local problem solving. Some of the most important achievements in providing food, upgrading housing, improving human health, and tapping new energy sources will come not through highly centralized national and international efforts but through people doing more to help themselves. When those most affected by a problem assume the primary responsibility for solving it, they gain the understanding and skill to deal with the broader political and economic issues of their society.

Many of the most successful efforts to solve global problems already take place at the local level. In the United States, home gardeners stretch their food budgets by up to 10 percent; in some socialist countries, private-plot agriculture provides one-quarter of many families' incomes. Self-help housing saves American homeowners one-quarter to one-half on construction costs and in the developing world, provides millions of homes. Self-health care cuts hospital admissions in half for some chronic illnesses, while basic preventive health measures reduce the incidence of coronary heart disease and cancer in industrial countries and of dysentery and parasitic infections in the Third World. Simple housing design changes that adapt homes to climate conditions reduce heating bills by 50 percent in industrial countries. Solar energy provides much of the power for Chinese villages. All these initiatives are decentralized and participatory. Their successes are the product of direct action by individuals and communities.[1]

People have always used individual initiative and local resources to provide for their basic needs. The difference today is that many of

The author wishes to thank Joe Belden, John M. Cohen, Jorge Hardoy, Roger Hickey, Catherine Lerza, John F. C. Turner, and Tarzie Vittachi for reviewing the manuscript.

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these efforts are more organized and successful than in the past. They have begun to receive the financial and political support of governments and international agencies frustrated by their own litany of failures. Nations have started to look to their own resources, trying to become more self-reliant in food and energy. Government housing and medical care programs are being decentralized to involve people at the community or neighborhood level in the delivery of services. And individuals are becoming more involved in organized self-help projects.

The ultimate success of these efforts may depend on the participatory nature of local problem solving. Individuals working on their own, without the support of their community, will be less successful than people working cooperatively in small groups. When those most in need participate in defining their problems, in deciding on a solution, in carrying out what needs to be done, in distributing the benefits of the solution, and in assessing their own work, the impact of self-help multiplies. Through cooperative self-help, individuals gain a sense of competence and self-respect and they strengthen their ties to their community.[2]

Today's local responses to global problems are halting first steps in a reappraisal of how best to meet humanity's most pressing needs. Such initiatives have their own limitations. Many will fall short of their immediate goals. But the fact that individuals and communities work together on basic problems is an accomplishment in itself. Where people have begun to take an active role in shaping their own destinies, especially when these efforts are linked with broader social reform movements, political and economic development has flowered. The much discussed and little-achieved building of a more equitable global society is proceeding in localities where people participate in, rather than just observe, the solving of their problems. In the process, many who once thought themselves victims of forces and circumstances beyond their control understand more fully the political and economic dimensions of their lives. This participatory approach to meeting basic human needs is proving that some of the seemingly intractable problems of the twentieth century are indeed manageable.

"The building of a more equitable global society is proceeding in localities where people participate in, rather than just observe, the solving of their problems."

Roofs Over Their Heads

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The street sleepers of Calcutta and the destitutes living in the Paris subway shock the sensitivities of people who sleep in a bed each night. In every society, however, these unfortunates are the exception. Most people, no matter how low their incomes, find a way to put some sort of roof over their heads.

This primal nesting urge may contain the seeds of a response to the worldwide shortage of adequate housing. Population growth and rising affluence have physically and financially outstripped the ability of governments and private industry to meet shelter needs. The United Nations estimates that the number of households will increase 44 percent between 1970 and 1985. In urban areas alone, however, authorized construction is expected to fall four to five million housing units behind demand each year during that period. This housing shortfall comes at a time when at least 800 million people are already living in badly built, badly equipped dwellings.[3]

Despite this widening gulf between housing needs and availability, current housing patterns suggest ways to bridge this gap. Home-ownership is rising in a number of industrial countries. Functioning communities built by the poor are springing up spontaneously in Third World cities. As the cost of conventional housing climbs, the middle classes everywhere have become interested in building and rehabilitating their own homes, as the poor have always done. Recent World Bank projects help families upgrade rather than replace even the poorest existing housing. These initiatives suggest that the solution to the housing problem will require the participation of those most affected by it.

Up until the mid-nineteenth century in Europe and North America, and until quite recently in Asia, Africa, and Latin America, people built their homes themselves or at least supervised the construction. John Turner, a British proponent of self-help housing, estimates that nearly two-thirds of all the housing ever built was constructed in this way. As social conditions and costs changed, it became socially acceptable and economically efficient, at least among the rich, to buy a

home or to contract for its construction. Social welfare policies that evolved gave many governments the role of providing housing for those unable to afford it on the free market.[4]

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This dual reliance on the marketplace and on public housing to meet shelter needs is no longer adequate. In both rich and poor nations, the price of land for housing sites and the cost of materials, labor, and energy in the construction industry are generally rising faster than other expenses. World Bank data indicate that even the cheapest existing housing units built by the organized public or private sectors are too expensive for one-third to two-thirds of the people in most developing countries.[5]

Housing costs are soaring in industrial countries. In the United States, the average price of a new house exceeded $54,000 in 1977 and home prices were rising twice as fast as incomes. In some parts of the country, the desire for a new home was so great that lotteries were held to choose between competing buyers willing to pay almost any price. Financial barriers to homeowning in Europe and Japan are even greater. The value of apartments on the Ile St. Louis in the center of Paris increased tenfold during the last decade. Houses get smaller and smaller in Tokyo as land prices soar. In Western nations, these rising housing costs will make it difficult for some people to ever become homeowners.[6]

In the Soviet Union, despite what must be history's most extensive governmental effort to supply low-cost housing, serious shortages remain. Although spiraling prices are not permitted in the controlled Soviet economy, housing pressures are reflected in the lengthening waiting lists for official housing and the open market in traded apartments. The shortcomings of the Soviet state-controlled housing market highlight the growing realization everywhere that public housing has failed to fulfill its promise. First seen as an orderly way to move people out of the squalor of deteriorating tenements, public housing has often done no more than replace a horizontal slum with a vertical one.

Designed for economic efficiency rather than aesthetics, public housing projects are too often sterile compounds without the jobs, stores,

and cultural activities that could make them livable, vibrant communities. Isolated in this way, public housing in countries all over the world has fallen into a desperate morass of premature deterioration and vandalism. The Pruitt Igoe complex in St. Louis, Missouri was demolished in 1972 because it was unlivable—only 20 years after the development won international architectural awards. The Grands Ensembles on the outskirts of Paris are stark masonry monuments to the dreariness of French public housing. The historic downtown centers of Moscow, Leningrad, and Kiev are now ringed with blocks of huge, monotonous, government-built high-rise apartments, badly constructed and devoid of supporting services.

Yet experiments in public funding of urban housing for the poor continue. The United States Government was enmeshed in the mid-seventies in a project called Taino Towers in New York's Spanish Harlem. Construction costs topped $60 million. Over the expected 40-year life of the project, these four 35-story towers will cost the government a total of $150 million for construction, upkeep, and interest, and possibly an additional $350 million in rent subsidies—all to house 656 families. In addition to the exorbitant costs of this housing, efforts to provide shops and jobs in the area have failed miserably.[7]

This, then, is the housing dilemma. Commercially constructed private homes are beyond the economic reach of more and more people. Public housing has proven too expensive for the government that builds it and often unlivable for the poor who rent it. So where will new housing come from? It may arise from the desire of both rich and poor all over the world to own their own homes, even if they have to build them with their own hands.

Private ownership of conventional dwellings is increasing in many countries. In the United States, nearly two out of three homes are owner-occupied. In France, the homeowning portion of the population has grown by nearly 50 percent in the last 15 years. A quarter of urban homes and more than half of homes in the countryside in the Soviet Union are privately owned. In Hungary, 63 percent of the housing is private; in Yugoslavia, over 70 percent. Even in China, most peasants in rural areas own their own dwellings; only in cities,

where a fifth of the population lives, are the majority of houses provided by the government. In almost every nation, public opinion surveys show that more people would like to own their homes.[8]

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In Africa, Asia, and Latin America, data on homeownership, although more sketchy, tell a similar story. In Mexico, two-thirds of conventional homes are owned by the occupants; in India, 85 percent. In many communities, even the poorest of the poor own their sparse shelters, but not the land they are built on. Unfortunately, the threat of being evicted can sap any incentive to improve their structures and offsets much of the advantage of homeownership.[9]

Governments and community organizers have begun to look toward the desire to control personal shelter as a fount of human resources. The illegal occupation of vacant housing in London and the overnight construction of shantytowns in empty lots in Mexico City show the willingness of people to take the initiative in meeting their housing needs. Such self-help can be channeled to meet the shelter requirements of large numbers of people.

Self-help housing takes many different forms in the industrial world. In the United States, it includes urban homesteading and extensive renovation and rehabilitation of existing housing. It extends to the resurgence of middle-class urban home buying and the substantial amount of owner-built housing. In Europe, self-help includes what the British call "gentrification" of historic but decayed urban centers, such as the Covent Garden and Islington areas of London. Rising costs force many young West Germans to work weekends and evenings adding interiors to the shells of their new homes, using what the Germans call "family power" to provide housing. In Poland, the government construction of housing was abandoned altogether in 1976 in favor of reliance on cooperatives, where greater participation by residents was seen as the best response to the housing crunch.[10]

Organized self-help housing in the United States was given a boost in 1973 when several cities, and later the Federal Government, started to match urban shelter needs with the mounting number of abandoned houses. This urban homesteading program is rooted in the pioneer philosophy that occupation and improvement of property gives

"A family with its own home has roots that may prevent the erosion of its community."

rights to ownership. Houses that have become government property in lieu of back taxes are sold for a nominal sum, often no more than a dollar, to couples or individuals willing to move in and rebuild them. Occupants buy their homes with the investment of their own labor in making housing improvements. Such "sweat equity" opened the door to homeownership through federal programs to 881 homesteading families by the end of 1977. Although this is only a drop in the bucket, interest in homesteading seems strong. More than 22,000 people have applied to become urban homesteaders and the government is expanding the program.[11]

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Experience shows that homesteading is economically justified. The Urban Homesteading Assistance Board of New York City estimates the cost of completely rehabilitating a two-bedroom housing unit in New York through sweat equity averaged $15,000 in 1976. This compares to development costs of approximately $32,000 for rehabilitation by a conventional contractor and $45,000 per unit for new construction. The social benefits of such efforts are impossible to quantify, but a family with its own home has roots that may prevent the erosion of its community.[12]

Unfortunately, urban homesteading is still beyond the reach of most low-income families. The mean income of an American homesteader is more than $12,000. Many available houses require repairs that are more expensive than replacing the house. To date, most programs focus on single-family dwellings, not on apartment buildings where many of the poorest people live. Most of the houses offered for sale have been in areas just beginning to decline. While such a location increases the likelihood of success for these homesteaders, organized urban homesteading is really only a way to stabilize neighborhoods, not to push back the slums.[13]

Self-help housing begins whenever a person picks up a hammer to repair a leaky roof or to fix a drafty window frame. It is difficult to estimate the improvement in the housing stock made by self-help renovation and maintenance. Such improvements are rarely measured in national assessments of housing capital. One indicator, however, is the proportion of home repairs done by the owner, or at least under his or her supervision. From 1972 to 1976, nearly one-third of the

$70 billion spent in the United States on housing repairs was for such owner-managed improvements. Home improvements seem to be of interest to middle-class homeowners in Europe too, as spiraling housing costs force many people to fix up their old homes rather than shop for new ones.[14]

Those who do go in for home buying in the United States often favor existing housing. In 1976, 50 percent of the growth in homeownership in city centers was due to individuals buying old houses, as rising prices for new homes made buyers more willing to renovate. By contrast, as recently as 1970, 80 percent of new homebuyers in city centers chose newly built houses and condominiums. Because of a willingness to invest time and money improving old houses, the arrival of today's homeowners can mark the rejuvenation of decaying neighborhoods. But it can also cause rising property values. This type of self-help housing can slowly push out the poor, forcing their housing problems onto another community.[15]

The gradual rebuilding of neighborhoods that were once blights on the urban landscape is reflected in the Urban Land Institute's estimate that between 1968 and 1975, 58,000 American housing units were privately rehabilitated in inner-city areas. It would be misleading to say that such efforts have stemmed the tide of decay engulfing the cities, for an estimated 150,000 units are abandoned each year. But they do reflect the increased interest of individuals and community groups in meeting their own housing needs.[16]

Self-help in the United States means not only rehabilitation but also home building from the ground up. Individual owner-occupants build more homes than does the government. Such housing accounted for one-third of new housing starts immediately after World War II. Rather than disappearing with rising affluence and a more sophisticated housing market, owner-built housing held a stable one-fifth of the market between 1964 and 1976.[17]

In 1976 over 200,000 families in the United States acted as general contractors who oversaw the design, financing, and construction of their homes. William C. Grindley, in the book *Freedom to Build*, estimates these home-builders save one-quarter to one-half on con-

struction costs over similar developer-built housing. As commercial housing costs continue to rise, individual initiative may grow in importance as families build the homes they cannot afford to buy.[18]

For most people living in rural areas in the developing world, self-help housing has been and probably always will be the only way to obtain shelter. There is no construction industry or public housing authority in the Altiplano of Peru or in the Sahel. In urban areas, the poor erect cardboard and sheet-metal shelters, adding more substantial siding or an extra room with the aid of family or friends when time and money permit. Initial government efforts to increase the supply of housing suffered from the enormity of the task, insufficient funds, and the bad examples of public housing in the industrial world. The first U.N. World Housing Survey concluded in 1974 that, despite a massive effort over the previous decade, housing conditions had become significantly worse in a majority of developing countries.

Government and international aid to self-help housing, a convenient marriage of available money and local initiative, is a logical response to these problems. Such efforts have been going on in many countries in a piecemeal way since the mid-sixties. The World Bank's basic urbanization project is the largest such program. Begun in 1972, in five years it provided $866 million for self-help projects in 15 countries.[19]

Initially, the World Bank's program consisted of "sites-and-services" projects, an approach to housing that encompassed a package of urban amenities including a dwelling site, roads, water, and sewage disposal. It was assumed that after minimal preparation the sites could be turned over to poor families who would have sufficient construction and maintenance skills to build themselves adequate housing. Unfortunately, it soon became clear that the cost of such a strategy—from $600 to $3,500 per dwelling—was prohibitive. Any thought of applying it to the several hundred million squatters in the world was out of the question.[20]

Many sites-and-services projects encountered problems because they resettled the poor far from their jobs and the handicraft markets that provide their meager incomes. These difficulties, combined with the

cost of the program, have led to a phasing out of the sites-and-services approach. It now makes up less than half of the World Bank's urbanization program. The Bank and national governments have been forced to rethink how best to assist self-help housing for low-income people. More money is being spent on programs that provide basic social services and that help people upgrade existing housing than on efforts to relocate families. This means that a community might get clean water at a central standpipe but not in every home, or that a compacted road might be built but sewage systems might not be provided. Providing assistance for the upgrading of existing housing is cheaper than moving people and it stimulates the local economy by drawing on indigenous material and labor.

Even the latest World Bank projects reach only a small number of people and fail to directly address the questions of land speculation and tenure. These problems, combined with the inadequacy of international financial resources, the absence of a private housing industry in developing countries, and the lack of government initiatives, leave unaided self-help housing as the only route to homeownership for many people. Self-help has always been an accepted tradition in rural areas. Until recently, however, those concerned with city housing viewed it with disdain, as a regrettable short-term solution to an immediate housing problem.

Researchers and community activists have now begun to consider unaided self-help housing and squatter communities in a new light. Long considered disorganized collections of society's exploited second-class citizens, some so-called slums are now seen as functioning economic and social entities, as communities in their own right. In Lusaka, Zambia, studies have shown that the overcrowded, desperately poor slums are not Dickensian hellholes. Squatters have built their own homes and landscaped their plots. They have formed cooperative markets, credit unions, and rudimentary schools, and have created some of the most democratic and responsive branches of Zambia's only political party.[21]

Many slums are far from the personally unfulfilling backwaters they are often caricatured to be. Tomasz Sudra, an urban planner from the Massachusetts Institute of Technology, reports that one in seven

"Some so-called slums are now seen as functioning economic and social entities, as communities in their own right."

squatters in Mexico City's slums runs a small business, often out of his or her home. In the Pinto Salinas area in Caracas, nearly a third of the residents are tradesmen, such as tailors, who also use their homes as places of business. Part-time carpenters, plumbers, and bricklayers in the slums form the backbone of the self-help housing movement, providing technical assistance to people building their own homes.[22]

The volume of self-help housing in the Third World—millions of housing units each year—indicates the economic and social strength of these impoverished communities. The ingenuity, drive, and initiative required to overcome the economic and material obstacles to building a home of one's own constitute a vital force that needs to be tapped more effectively if housing problems are to be solved.

But the record of residual poverty and underemployment, and the growing disparities in income within societies over the last generation, are statement enough that the poor cannot go it alone. Without financial assistance and the political will to effect social and economic change, government lip service to self-help housing merely shows the poor a path to better living conditions without removing any of the obstacles in their way. Only when people have land, basic services, and the means and opportunity to improve their communities and their homes will self-help mean any actual betterment of living conditions.

All too often, government initiatives in the housing field have superceded efforts by the homeless rather than complemented them. Governments should not attempt to do what people have already demonstrated they can and will do themselves. Government efforts would be better spent providing the services and backup for the majority of the population willing and able to make major contributions to their own homebuilding.

Facilitating the legal right to land use would probably be the most important government contribution to self-help housing. Community ownership of land in urban areas, with long-term leases for individuals, may be the best course of action. To the squatter in Calcutta and the urban homesteader in the South Bronx, confidence that their property will not be abruptly confiscated is of paramount impor-

tance. It is often the deciding factor between patchwork home improvements and an extended commitment by the occupant to better housing and to community development.

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Squatters occupy private and public land that they do not own. Assisting them to build new homes or to upgrade existing illegal dwellings can challenge the political and economic elites within society. The marginal land squatted on a decade ago by rural migrants as the first stop in their flight from the poverty and unemployment of the countryside is now, in many cases, valuable urban real estate. Legitimizing the poor's claim to that land is a bold political step few governments have been willing to take.

Government support for self-help housing must include funds for construction and long-term financing. Private banking institutions usually will not lend to people with low incomes—the very people most involved in self-help housing. In the private money market, competition for funds most often results in resources going to more lucrative investments. Governments must step in to provide initial capital and to help create institutions that effectively tap the meager savings of those involved in self-help projects.

Savings-and-loan associations and credit unions structured to keep the savings of the poor within their communities have proven effective sources of housing capital in some Latin American countries. Most of the financing for self-help housing should come in the form of loans. This would recycle insufficient financial resources, encourage individual initiative, and blunt the criticism of those afraid the poor are getting something for nothing. Obviously, no such financing scheme can continue to operate in the face of failure to repay these loans.

Many governments and lending organizations now work through local cooperatives that exert peer pressure to save money and to meet financial obligations. The World Bank has found that the involvement of the community in the initiation and administration of housing projects results in high levels of savings and of loan repayment.[23]

"Self-help housing can contribute to, but is not a substitute for, overall social and economic development."

Government regulations to limit land speculation can further aid communities and individuals to meet housing needs. If land is to be turned over to those who occupy and improve it, then any unearned increment in land value should accrue to the community and not to the newly tenured occupant. Only in this way can government efforts to encourage self-help community development not be short-circuited by individual profit making.

Government and international lending agency regulations are often tied to inappropriate housing standards that unnecessarily impede self-help housing and stifle the development of community supply and service networks. Housing standards should, where possible, help attain socially beneficial goals, including minimum standards for safety and energy efficiency. In all too many cases, standards prescribe that a wall must be of brick, so many inches thick, rather than that a wall, of whatever material, must insulate to a given degree and bear a given load. Specifications of performance rather than of components would allow home builders to construct a cheaper and more appropriate dwelling using their skill and imagination. Such standards rely on age-old local building techniques, which are more likely to be within the occupant's construction capabilities and resources as well as better-suited to local climatic conditions.[24]

Self-help housing is an important and growing response to the global housing shortage. But improving the housing stock beyond a bare minimum depends on the majority of the unemployed and underemployed finding meaningful and productive work. Self-help housing is a means by which the poor can shelter themselves. It can contribute to, but is not a substitute for, overall social and economic development.

The demand for housing will grow over the next quarter-century. Rising prices will make it difficult for the marketplace to meet much of this demand. The enormity of the task limits the role of governments. But both the marketplace and government can complement the increasing reliance on self-help housing. The couple in London rehabilitating the shell of a nineteenth-century house and the squatter family in Lima both need government help to ensure tenure and financing, to encourage stability of ownership, and to stimulate com-

munity development that can protect investments in self-help housing. The local marketplace is usually the best source of materials and services, as well as some financing, for the occupant-builder. Using the marketplace and government assistance in this way, the housing-poor can be their own best planners and builders—investing more time, initiative, and labor in housing construction and improvement than any public or private developer can.

The benefits of self-help housing to individuals and to their communities are hard to measure. And the hardship of life in the slums of a developing country or in the urban ghettos of the industrial world must not be minimized. Yet as John Turner has pointed out, "When dwellers control the major decisions and are free to make their own contribution to the design, construction, and management of their housing, both the process and the environment produced stimulate individual and social well-being."[25]

Small Is Bountiful

Rising food prices and national food shortages in the seventies have forced a major reassessment of how to squeeze more food out of the land and how to ensure that it gets to those who most need it. Consumers and individual countries have begun to rely more on their own resources to meet part of their food budgets. Food self-reliance is taking root at the local level: there is renewed interest in home vegetable gardening and recognition in countries with collective agriculture of the contribution made by private farm plots. Around the world, food self-reliance has meant greater support for highly-productive, owner-operated small farms to reduce the vulnerability inherent in dependence on food imports.

The demand for food has never been greater. Despite unusually good grain harvests in both 1976 and 1977, world grain reserves for 1978 equaled no more than 54 days of consumption. These reserves are less than those that existed in 1972, when simultaneous bad harvests in the Soviet Union and India wiped out world stocks almost overnight. World food security rests on a precarious edge. At the per-

sonal level, per capita fish consumption worldwide turned downward in the early seventies and the postwar rise in per capita grain consumption ended. Continued population growth and past abuse of croplands and oceanic fisheries will make improvement of the food situation a slow and difficult task. Sudden international price rises and the loss of traditional foreign supplies have underscored the vulnerability of countries and individuals to the vagaries of climate, economics, and politics. Events beyond their control have shaken the faith of farmers and consumers in the current organization of agricultural production.[26]

As part of an international effort to avoid future food shortages and abrupt price changes, the World Food Conference in Rome in 1974 spelled out a strategy to assist food-poor countries. A world food reserve was called for as well as greater aid to small farmers in developing countries. Four years later, these grand international schemes have raised many hopes but filled few bellies. U.S. Secretary of State Henry Kissinger's challenge to the Food Conference—that by 1984 no child should go to bed hungry—has been consigned to the dustbin of political rhetoric.

While governments have debated, food self-reliance has begun at the local level. There is renewed interest in gardening in the United States. An estimated 32 million households, approximately 43 percent of all families, raised fruits and vegetables in 1977 on an area equivalent to approximately seven million acres—in backyards, in city lots, and on apartment balconies. This represented over seven million more gardens than in 1971. While the number of people who hoe and weed seems to have stabilized in the last few years, seven million people without access to land told Gallup pollsters they would garden if the government would give them a plot. There is considerable European interest in gardening as well: the demand for gardens also exceeds the supply of land. The number of people on British waiting lists for a government-owned garden plot grew from 21,000 in 1972 to 57,000 in 1974.[27]

In response to the interest in small-scale food production, the U.S. Government allocated $1.5 million in 1977 for pilot urban gardening projects in six cities. The program has been expanded to 16 cities for

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1978, with $3 million in funding. Pennsylvania, Connecticut, and Massachusetts have statewide community gardening programs, often using state-owned land. City-sponsored programs serve thousands of people in Boston, Chicago, Detroit, and Los Angeles. In total, nearly three million people now garden an estimated 30,000 community-owned garden sites. In addition, many school systems now actively encourage gardening: some 21,000 children in Cleveland, Ohio and an estimated 400 schools in Alabama are involved in such schemes.[28]

For many people, gardening has shifted from a casual activity to a relatively intensive, small-scale food-producing operation. Gardens for All, an organization that supports expanded gardening programs, estimates the retail value of homegrown vegetables in the United States was more than $14 billion in 1977, compared with a total national food expenditure of $217 billion. An intensively worked backyard garden can produce a pound of vegetables per square foot. With this level of productivity, the average American could meet his or her annual vegetable needs with a 10-by-30-foot plot. Gardeners using more sophisticated methods get even better results.[29]

The drive that motivates food consumers to become producers is not only economic. Gardeners like the better quality and taste of homegrown vegetables and fruits. American respondents in national Gallup polls cited saving money as their prime motivation in 1974, but by 1977 the most popular reason for gardening was recreation. The average gardener puts in a little less than an hour a day in season and finds it both restful and good exercise. Community gardening programs have also turned out to be strong community-building mechanisms. Urban gardeners in organized programs often report a renewed sense of commitment to the local community and a spirit of neighborly cooperation. Because so many people now garden for social and personal reasons, their commitment to growing some of their own food is unlikely to be subject to fluctuations in the economy. These motivating factors suggest the number of gardeners will not decline significantly in the near future.[30]

Despite its many benefits, however, gardening does have a dark side. There is growing evidence of high levels of lead, cadmium, and other

"An intensively worked backyard garden can produce a pound of vegetables per square foot."

heavy metals in vegetables grown in polluted urban areas. While no conclusive tests have yet been run, the potential for the poor and other urban residents to meet at least some of their own food needs may ultimately rest on efforts to reduce air and soil pollution.[31]

Gardening programs have also become important parts of food self-reliance strategies in developing countries. Both Ghana and the Philippines have stressed home vegetable-growing as a means of improving nutrition. Unfortunately, the programs have met with a mixed reception. A more successful effort has been mounted by the Jamaican government under its "Grow Our Own Food" campaign. In the rural St. James parish studied by Thomas J. Marchione of Case Western Reserve University, the proportion of homegrown food in the household diet grew from 38 to 56 percent from 1973 to 1975. The amount of income spent on food decreased and child malnutrition dropped significantly.[32]

In Eastern Europe and the Soviet Union, attention is also turning to consumer food production. Socialism's commitment to centralized farming has been tempered by reliance on private production from small plots allotted to workers on collective and state farms. This small-scale production is desperately needed to offset some of the shortfall in food production on larger state holdings. In the Soviet Union, more than one-fifth of the potatoes, fruits, and vegetables and one-third of the livestock products now come from private production. In 1977, Soviet leader Leonid Brezhnev publicly stated that local officials should put aside philosophical misgivings and support small-scale private farming because the economy needed the produce. In Hungary, 36 percent of agricultural produce now comes from small-scale operations on 15 percent of the agricultural land, which includes both private plots on collective farms and other small holdings. In 1974, reversing a long-standing policy, Bulgaria too began efforts to stimulate development of individual plots on collective farms.[33]

Similarly, collective farming in China has not been sufficient to meet all the country's food needs. An estimated 25 to 30 percent of total household income in the early sixties came from the private production of vegetables, poultry, and pigs. This proportion may have decreased somewhat in recent years, yet small plots are still numerous

and the peasants' right to farm privately was included in the new Chinese constitution adopted in January 1975. The produce from the small, intensively worked plots, usually no more than 5 percent of communal land, supplements the grower's family-food budget or is sold to the commune's purchasing cooperative. It can also be sold by the gardener directly to his or her neighbors, although Peking has periodically attempted to clamp down on such rural free trade.[34]

The Chinese government's official position on private production is ambiguous. During the Cultural Revolution, private plots fell into disuse, contributing to an overall decline in food production. With the return of stability, the government relaxed restrictions on non-communal work. Premier Chou En-lai told a group of American visitors in 1971 that private plots were necessary to stimulate the initiative of the peasants, so that they could earn something in addition to their collective income while ensuring some variety in their diet. However, it is now accepted agricultural policy to "learn from Taichai," a model commune in North China where peasants decided in the mid-sixties to give up all their private plots. It remains to be seen whether their example will measurably curb extensive private production. More likely, Chinese officials will continue to tolerate garden plots, but will exercise greater marketing control so that work on private land and the individual profit motive do not undermine the collective economy.[35]

Enthusiasm for increased gardening and the greater use of private plots should be tempered by a realistic appraisal of what small producers can and cannot accomplish. Private plots now provide one-tenth to one-quarter of food production in many socialist countries. The average American gardener saved more than $375 on his or her food bill in 1977 while benefiting from better nutrition and healthy recreation. Governments can encourage such initiatives by providing land for gardeners in urban areas and agricultural extension services for all gardeners. Yet home gardeners and those who tend private plots cannot feed themselves solely through their own production.[36]

The trend toward greater food self-reliance among individual consumers is complemented by recent attempts to reorganize food pro-

duction at the national level. At one time it was an article of faith in both free-enterprise and state-controlled agriculture that efficiency was synonymous with more land, larger machinery, and capital-intensive farming methods: bigger was seen as better. This orthodoxy is changing as the advantages of small-scale production become more apparent. Since small farms are more likely to produce food for local consumption, governments are considering supporting small farmers in an effort to unhook national food economies from a dangerous dependence on imports.

Until the mid-seventies, American farms were clearly consolidating: the number of owner-operated small farms dropped steadily. Average farm size rose; more of the food on American dinner tables came from large farms. Expanding markets were an incentive for farmers to concentrate production on one crop, such as soybeans or wheat. Increasingly, food was grown or marketed by major nonagricultural corporations whose national and international production considerations meant the decline of farming geared for local consumption. The small farm, once synonymous with food self-reliance, was neglected.[37]

Recent U.S. data suggest some of these trends have begun to cut in the other direction, as society examines some of the hidden social, environmental, and economic costs of ever-expanding farm size. In the mid-seventies, small farms were disappearing at a slower rate than a decade earlier. Pennsylvania even reported 2,000 more farms under cultivation in 1976 than in 1974. Numerous actions by state governments—providing loans for young farmers to buy land, impeding further corporate farm acquisitions, and improving the marketing arrangements for small farmers—indicate renewed political support for a pluralistic agricultural economy.[38]

Even in some socialist countries the small farm remains solidly entrenched. In most Eastern European countries farming has been collectivized, but in Poland and Yugoslavia, private holdings still account for 80 to 85 percent of farmland. Since 1970, in the hope of increasing production, many governments have emphasized increased farm specialization and enlargement of the scale of production. This trend has placed ideology in clear conflict with experience. The higher

productivity of private plots and small farms suggests that the drift toward consolidation may not be a wise policy.[39]

24 In China, farming has also gone through a process of collectivization. In the early fifties, the Chinese decided that the first objective of the socialist transformation of agriculture would be to feed the people in the countryside and to meet other basic peasant needs before using rural surpluses to fuel urbanization and industrialization. They felt that this could only be accomplished through mobilization of the masses of Chinese peasants. Rural reform vested ownership and management rights in communes—generally a collection of villages. Having learned from the Soviet collectivization disasters of the thirties, private ownership was replaced by communal, rather than state, ownership. The farms now belong to those who work them, so that increased production first benefits the farmer and the community.

Through forging this direct bond between the farmer and the land, China has adapted the production efficiency of owner-operator farming to its socialist experiment. The highly decentralized Chinese approach to agriculture, augmented by private plot production, has proven most successful. The food supply has expanded steadily, the recurrent cycle of famine so prevalent earlier this century has been broken, and the more equitable food distribution has led to impressive improvements in nutrition. There is every reason to believe this progress can continue, and that China's rural-oriented, self-reliant mix of collective and private agriculture is uniquely suited to meet its future food needs.

Trends in the organization of agriculture in other parts of the world are less well-defined. Rural reforms in Taiwan, South Korea, and Japan have focused on the family farmer. In Taiwan, the proportion of farm families who owned all the land they cultivated increased from 36 percent in 1950 to 78 percent in 1972 because of a "land-to-the-tiller" program. In South Korea, owner-operators constituted 14 percent of all farm households in 1945, but 70 percent by 1965. In other parts of the world, however, land is not distributed as equitably.[40]

There is no clear-cut indication that land reform increases food production, yet it seems to be a necessary first step. When accompanied

"Many observers now agree that owner-occupied small farms are of benefit to society."

by the provision of agricultural support services for the small farmer, it has increased production. In Taiwan, following land reform, the rice yield per hectare increased by more than 80 percent between 1950 and 1972. In Japan, productivity increased so much that a country the size of California is able to grow enough rice to feed 115 million people, with a surplus for export. Technical services are not the only explanation for this higher productivity. Land reform induces farmers to increase their personal investment of labor, capital, and fertilizer. With more to gain from increased production, owner-operators put more of themselves into their work—what John Kenneth Galbraith has called self-exploitation.[41]

While global trends in agriculture often seem contradictory, the growing interest in the productivity and social significance of small farms cuts across a number of different cultures. By the best yardsticks of agricultural policy—productivity, job creation, energy use, environmental impact, and the well-being of rural society—many observers now agree that owner-occupied small farms are of benefit to society.

Whether judged by yield per acre or by the cost of production, small farms compare favorably with large farms on all continents. Most of the economies of scale associated with size can be achieved on units small enough to be farmed by a family. Numerous studies have borne this out. A 1970 survey for the United States Agency for International Development (AID) showed that small farms in India, Japan, Taiwan, the Philippines, Mexico, Brazil, Colombia, and Guatemala had higher productivity per acre than large farms. A similar study of 40 countries undertaken by the World Bank indicated that small holdings and relatively equitable land distribution were associated with an increase in output per hectare.[42]

In 1967, U.S. Department of Agriculture economist J. Patrick Madden reviewed 138 studies on the production costs of different-sized American farms and found mechanized one- and two-person family farms consistently more efficient than larger operations. To be sure, American family farms are much larger than owner-operated farms in other countries, but U.S. family farms are small in relation to many of their corporate counterparts. It was their relative size and the fact that

they were owner-operated that seemed to account for their higher productivity.[43]

Many of the sources of this higher productivity are related to the social and environmental advantages of small farms. Small holdings in developing countries provide more employment than large holdings do. The small farmer is often an efficient user of available energy—wind, draft animals, and human labor. Policies that encourage reliance on such renewable resources may enable much of the world to bypass the energy-intensive and increasingly costly agricultural methods of the industrial world.[44]

Few studies exist comparing treatment of the land based on both tenure and size. What information does exist suggests that owner-operated holdings, which are usually smaller, are much better cared for than large tenant landholdings. This problem is particularly important in North America, where farmers are renting more land to increase production. Recent studies in Iowa by John F. Timmons and Wade Hauser of Iowa State University show that tenant farmers annually lose to erosion 20.9 tons of soil per acre, while farmers who own their land lose only 15.6 tons per acre. The authors conclude that tenure problems are a major stumbling block to the adoption of soil conservation practices.[45]

While society may worry about maximizing production and minimizing expensive energy use, the individual farmer is most worried about increasing personal income and improving the rural standard of living. The accumulation of farmland in the hands of a few large landowners leads to an inequitable situation that not only denies people an adequate source of income but also saps the rural community of its vitality. Isao Fujimoto, of the University of California at Davis, conducted an extensive study of 130 towns in the San Joaquin Valley of California in 1976. He found that landholding patterns created startling differences in social life. Economically, politically, and culturally, small farm communities were more diverse, with a wider range of human services, than towns where large farms predominated.[46]

"Rural romanticism must not blur the distinction between food self-reliance and subsistence farming."

Despite the numerous advantages of small-scale production, a small farm strategy is not without its limitations. Rural romanticism must not blur the distinction between food self-reliance and subsistence farming. Life on a small farm should not be a marginal existence. The restructuring of the food economy in developing countries will require political strength and sophistication to ensure that farms are large enough to feed the farmer's family as well as to generate some surplus for the growing number of urban consumers.

Adequate capital and credit to fund land transfers and to create a rural infrastructure are necessary if the small farmer is to succeed. In developing countries, some of this can be provided through the billion-dollar International Fund for Agricultural Development, which went into operation in 1978. This loan fund will attempt to overcome past credit discrimination against small farmers; World Bank and AID studies indicate such landholders are usually as good as or better credit risks than large farmers.[47]

To gain the greatest benefit from small-scale production, cooperation among producers will often be required. In France, small farmers have banded together to form the industrial world's largest experiment in group farming. These Groupements Agricoles D'Exploitation en Commun (GAEC) are not cooperatives. Each farmer retains individual landownership, but there is a common management of production and marketing. It is hoped that the GAECs will distribute more evenly the agricultural workload, increase productivity, and improve the farmers' economic security while retaining the incentive and individual responsibility that has characterized French peasant farms in the past. To date, most GAECs have been composed of blood relatives, who often join together only to qualify for special government credits; the replication of this experiment is therefore somewhat in question. Yet the number of GAECs tripled between 1968 and 1973 and they now account for 1 percent of French farmland.[48]

If consumers and producers are to reap all the benefits of small-scale production, cooperation and local participation must extend beyond the farm. Small producers need local marketing mechanisms. To meet

this need in the United States there have recently been efforts to re-establish locally-controlled marketing operations. In Vermont, direct sales by farmers account for an estimated 6 percent of the food sold in the state. Eighteen states now subsidize direct marketing of small-farm produce. Newly established state-funded farmers' markets in Pennsylvania sold $114 million worth of produce in 1975. In West Virginia in 1976, farmers' markets sold nearly $7 million of small-farmer grown vegetables and other products. The U.S. Department of Agriculture is now funding state programs in direct marketing to support this vital link in the local production chain.[49]

Meeting future food needs will require innovations. The small family farm, often highly productive, must be strengthened. Cooperative or collective farming efforts must somehow balance the advantage of access to credit and mechanical equipment that often comes from working together with the productivity that comes from individual initiative. The practice of growing food far from where it is consumed must be rationalized with rising labor, energy, and marketing costs and other inefficiencies of separating the producer from the consumer.

An optimal food strategy will obviously include some large-scale farming. But one key element in future food policy must be more production by small farmers and gardeners. Such local food production is an important aspect of the success of Chinese agricultural and nutritional policy. Eighty percent of the vegetables consumed in each Chinese city are grown within ten kilometers of that urban area. Massachusetts, in the United States, imports 85 percent of its food, a tenth of it from 3,000 miles away in California. The contrast could hardly be more striking.[50]

Through small-scale production, local distribution networks, and the involvement of more people in food-growing, the vulnerability of communities to price rises and food shortages can be reduced. In a world where the slack appears to have gone out of the food system, reorganizing production in this manner can help create a margin of safety, a buffer against malnutrition and rising food costs.

Taking Responsibility For Health

Two health concerns dominate people's lives: how long they will live and how often they will be sick. Ever greater investments in hospitals, drugs, and medical technology are largely irrelevant to these interests. Living healthier and longer lives in the future will depend more on individual and community efforts to solve their own health problems. In industrial countries, this will mean a cleaner environment and changes in personal life-styles, habits, and diets. In developing countries, it will include improved access to simple medical care and preventive health measures that rid communities of the causes of disease.

Already, health care consumers and much of the medical community have begun to realize that individuals can assume greater responsibility for their own health. Preventive health care programs—a community-wide extension of individual efforts to protect health—are getting people to dig latrines and wells in poor countries and to improve their diet and to exercise regularly in rich countries. Changes in the delivery of medical services parallel this emphasis on the roles of the individual and the community. Primary care—everything from treating minor aches and pains to dispensing family planning—is once again seen as the most effective and least expensive way to provide medical services. Neighborhood health care is becoming possible for the first time for many people through the use of barefoot doctors in China and local health workers in Cuba.

Society's perception of the most appropriate ways to deal with today's important health problems is changing. The World Bank estimates that 800 million people—one fifth of the world's population—still have no access to even minimal health care. According to the World Health Organization, less than 10 percent of the children born each year in poor nations are immunized against the five most common fatal childhood diseases. These children need preventive medical services that can most easily be provided by paramedics. Americans spent $69 billion on health care in 1970 and $139 billion in 1976. Slowing these escalating costs will require greater use of general practitioners, more self-care, and healthier life-styles.[51]

Similarly, there is a growing realization of the environmental sources of many diseases. In developing countries, polluted or inadequate water supplies doom over a billion people to repeated bouts of gastroenteritis, a severe inflamation of the stomach and intestines. In industrial countries, diseases of the heart and circulatory system account for half of all deaths. The National Cancer Institute in the United States now estimates that one in four Americans will develop cancer. The vast majority of these illnesses are the result of poor diet, unhealthy habits such as smoking, and pollution. In both rich and poor countries, preventive health care efforts at the community and individual level can help reduce the incidence of environmentally related diseases.[52]

Each person can do much to care for his or her own health. Most illnesses run their own course and are rarely life-threatening. Common sense and traditional home remedies are often sufficient cures. Most people provide themselves and their families with rudimentary health care without professional medical help. Studies in Denmark and Great Britain have shown that more than 90 percent of those visiting a general practitioner have already begun a self-prescribed treatment that is consistent with their subsequent medical therapy. Self-awareness and self-interest can be powerful assets in improving health.[53]

To structure this innate resource, about five million people in the United States now belong to physical or mental self-help groups of some kind—including everything from Alcoholics Anonymous, the largest, to Migraines Anonymous and Psychotics Anonymous. Some join to change unhealthy personal habits, others to find a supportive community that will help them cope with their problems. But all are individuals treating their health problems themselves, without resorting to formal medical care.[54]

In the United States, gynecological groups are one of the fastest growing elements of the self-help medical movement. Through the sharing of information and experiences, they help women better understand their bodies and how to care for them. Many of these small groups are attached to women's clinics. Surveys of women seeking health care have found that those attending self-help clinics better

understand their anatomy and the frequency with which various medical examinations should be performed than women attending other types of medical facilities. More importantly, these women can better identify the common health problems that may arise with contraceptive use.[55]

Self-help medical programs run by the medical establishment have also proven quite successful. A diabetics' self-care program run by the University of Southern California reduced the number of patients experiencing diabetic coma and led to a 50 percent drop in emergency room visits. Test programs with hemophiliacs and others who suffer chronic illnesses have also cut hospital admissions. As the cost of formal health care rises, the importance of self-care will grow. The University of Southern California diabetic program saved hospitals and consumers $1.7 million over a two-year period, a mere fraction of the overall savings that could be realized if self-care became the first line of medical defense.[56]

The greatest potential contribution of self-care may be in countries with little or no organized medical service. The rural poor in Africa, Asia, and Latin America have long treated their own illnesses using indigenous herbal medicines. An estimated 65 to 90 percent of those who fall ill in South and Southeast Asia use herbal cures in conjunction with a visit to a native healer. Much of this self-care is worthless or dangerous but all of it should not be dismissed out of hand. Pharmacologists have only begun to study the curative powers of home remedies. China encourages the use of traditional medicines to go hand in hand with modern medicine. The World Health Organization is also exploring ways traditional cures can complement professional medical care.[57]

The spread of self-help medical care reflects people's interest in caring for themselves. This does not mean, however, that the ill would do best to totally avoid the medical system. Certainly, many people look to doctors as shamans, with magical powers to cure their every ache and pain. To their discredit, medical professionals have often fostered that image. Yet in life-threatening situations, the assistance of trained personnel has demonstrably reduced mortality and morbidity. Any organized self-care program should include some professional moni-

toring to ensure that serious health problems are not mistreated. Self-care can, however, reduce some of the pressure on the overburdened health care system. Moreover, while self-care does not necessarily keep people from becoming patients, it may make them better patients by giving them the initial responsibility for their good health.

The logical extension of increased recognition of the individual's role in treating health problems is the growing responsibility of the individual and the community for preventing those circumstances that cause disease. Better nutrition, which would make probably the single most important contribution to improved health, can start with the family. Recent studies indicate that cutting back on saturated fats and sugars at the dinner table will help prevent tooth decay, coronary heart disease, and some of the more common forms of cancer prevalent today in Europe and North America. In developing countries, the continuation of the traditional practice of breastfeeding will reduce infant mortality and increase the resistance to malaria and many childhood diseases. A vegetable garden, whether raised by the rich or the poor, will provide a supplement of the vitamins and minerals now deficient in many diets.[58]

Overcoming the health problems of a sedentary life-style starts with each person exercising more. Studies show that regular vigorous exercise strengthens the cardiovascular system, reducing the likelihood and severity of heart attacks. The associated medical savings have not been overlooked by businesses paying some of their employees' health bills. More than 300 large U.S. companies now have physical fitness and exercise programs for all their workers. A number of cities have laid out jogging paths and have built recreational facilities needed by middle-aged, under-exercised people. Institutions and governments can create the ambience in which exercise is encouraged, but only individuals can do the running, swimming, and bicycling that contribute to good health.[59]

The importance to good health of personal habits cannot be overemphasized. A study of 7,000 adults in California showed that those who lived longer and healthier lives got adequate rest, ate three meals a day, exercised, did not smoke, and did not overeat or overdrink. Other research suggests that similar life-style changes could save

more lives among the middle-aged than any conceivable advances in medical science.[60]

Yet the responsibility for better health cannot rest solely with the individual. Even the most well-informed and financially independent person may be unable to assess the health impact of various foods or habits and may fall victim to advertising or to traditional misconceptions. Individual responsibility for health does not absolve the government or the community from equally important roles in preventive health care.

Indirectly, government policies have often served to improve nutrition and health. Yet no government has established a comprehensive national nutrition strategy. American policymakers have turned a deaf ear on calls by the Senate Select Committee on Nutrition and Human Needs and others for a U.S. nutrition policy. Norway has tried unsuccessfully for several years to structure taxes and new agricultural policies to change eating habits.

Two closely tailored local programs have had more encouraging results. In the mid-seventies, a Stanford University program attempted to reduce heart disease in two California communities by increasing public awareness of its causes and effects. Fewer cigarettes were smoked, the consumption of saturated fats declined, and the blood pressure of those tested was reduced—all changes associated with better health. In North Karelia, a rural part of eastern Finland, doctors noticed during the early seventies that proportionally more people died of heart disease in the county than anywhere else in the world. In 1972, at the community's request, a preventive health campaign was launched to stop smoking and to reduce blood cholesterol levels. By 1975, the proportion of men who smoked had fallen from 54 to 41 percent, while the proportion of those with high blood pressure had declined from 39 to 34 percent.[61]

Such public education efforts are of growing interest to many governments, especially in developing countries hard-pressed to meet rising medical care needs. They are realizing it is cheaper and more humane to prevent rather than to treat illnesses. In Tanzania, the

government mounted a campaign in 1973 to create an awareness of specific health problems in rural areas and to recommend actions that individuals and communities could take to remedy them. In a ten-week effort, Radio Tanzania broadcast educational programs in coordination with study groups involving nearly two million people. The exercise led to a number of simple village-level preventive health care measures—the construction of latrines, for example, and the addition of mosquito netting to many windows. In neighboring Kenya, a radio program gives health tips in the format of a situation comedy. The themes are simple and center on individual action to improve health, such as washing vegetables before eating them and bathing frequently.[62]

There have been less well-organized public education efforts in industrial nations to reduce tobacco smoking. Studies in the early sixties that first linked smoking to serious illness led to at least partial bans on cigarette advertising in the United States, Britain, and Italy. In 1976, Italy banned the use of tobacco in most public places; several American communities have introduced similar restrictions. Governments can encourage people not to use tobacco, but the decision not to smoke can only be taken by an individual. While the results of government efforts are mixed, they do seem to be having some effect. In the United States, the proportion of adult men and women who smoke has declined in the last decade, although smoking among teenage women is on the rise.[63]

Like good nutrition and healthy personal habits, family planning is a preventive health measure that requires an individual commitment. Women without access to family planning services lack the means to avoid having babies too early or too late in life, and to space and limit the number of their children. These women die more frequently in childbirth and are more likely to suffer the anguish of still-born births or infants who die of simple infections. Governments can reduce this toll through participatory family planning programs. Peer pressure in birth planning groups can encourage couples to change attitudes about family size and contraceptive use. Studies in China and Indonesia suggest these self-help efforts contribute to lower birth rates and to reduced maternal and infant mortality.[64]

"Sweden now requires two out of five new doctors to emphasize primary care."

The simple nature of many health care needs and the environmental sources of much illness argue forcefully that self-care and preventive health care have important roles to play in responding to basic health problems. Yet many health problems need some basic medical treatment that is often unavailable. For example, rural Americans are twice as likely to have never had a physical examination as city residents, and thus the symptoms of serious illness can go undetected. In a dozen Latin American countries surveyed by the Pan American Health Organization, pediatrics and public health—the medical specialities most needed—ranked lowest in popularity among physicians.[65]

Dissatisfaction with the neglect of such basic medical care has led to a decentralization of services to reach those in the front lines of illness—in the workplace, in poor neighborhoods, and in rural areas. General practitioners, who provide primary care, often live in the same neighborhood as their patients. The 25-year decline in their number in the United States has meant the growing separation of the medical system from people's basic health care needs. In the hope of reversing such trends, U.S. medical schools recently began to train more general practitioners. Sweden, with the same lack of medical professionals specializing in common health problems, now requires two out of five new doctors to emphasize primary care.[66]

To better reach the urban poor with primary health care, the U.S. Government initiated a series of Neighborhood Health Centers in 1965. The more than 150 centers treat over one-and-one-half million patients each year, mostly children 5 to 14 years old and women of childbearing age. Although doctors and nurses are in attendance, most workers are local residents with minimal medical training. They often conduct community-wide education and testing programs, screening patients for sickle-cell anemia or lead poisoning. Evidence indicates that the programs have had some success. A survey in Rochester, New York compared children who attended a Neighborhood Health Center with other children in the area. Those who received regular care locally entered the hospital less frequently and stayed a shorter period of time when they were admitted. Other surveys show that after the opening of these health centers, infant death rates in a number of cities dropped by one-third to two-thirds.[67]

Many rural communities, even in doctor-rich countries like the United States, lack physicians trained in basic health care and are too small to support local clinics. To improve medical care in the countryside, the U.S. Government established in 1971 a National Health Service Corps, paying government stipends to students in return for two to four years service upon graduation. The communities where these medical personnel are placed also do a great deal to support them—often paying for their office space and for a nurse or secretary. To place a doctor in a small town for only a few years costs between $100,000 and $200,000. The number of doctors, dentists, and nurse practitioners involved total less than 1,000 after a seven-year effort. Compared with the need and the efforts to decentralize medical services in other countries, this approach has limited value.[68]

Medical auxiliaries, who can perform basic medical procedures, are a better means of making health care both more accessible and more efficient. There are a growing number of such physician's assistants in the United States, where 48 states now license doctor's helpers. They take blood samples, give immunizations, and stitch up wounds —all things that can be safely and more cheaply done by trained non-physicians. Midwifery also seems to be returning as an accepted profession in the United States. Unfortunately, there has been no movement in the United States, Europe, or Japan toward developing a cadre of the most important medical auxiliaries: door-to-door health workers with the skills to treat basic illnesses and the interest in mobilizing individuals and communities in preventive health efforts.[69]

The reemphasis of basic health care in the industrial world extends beyond the training and relocation of medical professionals. With the U.S. Public Health Service estimating that 390,000 workers contract an occupational disease each year, unions have begun to assume responsibility for the health of their members. The United Auto Workers negotiated in their 1973 contract for the industry to employ one worker full-time at each plant to monitor safety and pollution. Because so little is known about the health impact of chemicals in the workplace, the United Rubber Workers of America arranged in 1971 for the Schools of Public Health at Harvard University and at the University of North Carolina to compile in-depth health profiles of 70,000 of its members. This data bank has already turned up evi-

"Medical auxiliaries are a better means of making health care both more accessible and more efficient."

dence of increased incidence of leukemia and other cancers. The Oil, Chemical, and Atomic Workers International Union now sends medical interns and residents into union halls to take health histories and to run tests on workers.[70]

Occupation-related health care for workers has received even greater attention in Europe. In Sweden, study circles on health and safety education have been held in the workplace during working hours since 1974 under an agreement between industry and unions. Some industries have developed original methods of delivering health care services: Swedish construction firms provide medical care at building sites via mobile home treatment units. In a variety of settings, workers' health problems are being dealt with not only in hospitals years after they begin, but also in the workplace through primary and preventive care.[71]

While emphasis on primary health care is a new and growing concern in the industrial world, the volume of unmet basic medical needs in the Third World has long argued for such an approach. Longstanding ties to Western medicine have impeded a shift in this direction. Only in the last decade have governments and international agencies begun to encourage decentralized delivery of services.

China's barefoot doctors are undoubtedly the best known example of primary care aimed at and involving local communities. They acquired their picturesque name because around Shanghai, where the movement began, they often were agricultural workers who went barefoot in the rice paddies. Their equivalents in factories and urban neighborhoods are called worker doctors. Estimates put their combined numbers in 1976 at over 1.3 million. They are the first line of medical defense in China. They are not full-time medical assistants, but part-time workers trained to diagnose and treat common diseases without assistance. Barefoot and worker doctors are urged to make serious attempts to solve all health problems themselves before referring them to hospitals and clinics. They use both traditional and Western medical techniques, broadening the curative powers available to the local community. Their duties include the running of village health centers and the dissemination of birth control information.[72]

Barefoot doctors are really community health workers, and their efforts are judged equally for their curative and preventive work. They coordinate mass public health campaigns that have political support at the highest level. Typical of these has been the effort to eradicate schistosomiasis, a snail-borne parasitic disease that afflicted more than ten million Chinese in 1955. In a series of public campaigns, lasting anywhere from one day to several weeks depending on the season, peasants have spent literally millions of hours killing the snails that carry schistosomiasis, cleaning up irrigation canals and water sources, and recycling human waste so that the parasite will not return.[73]

Although China is a poor country by any traditional economic yardstick, life expectancy approaches that of wealthy industrial societies. Reports also indicate that, at least in urban areas, 95 to 100 percent of children are immunized against such diseases as measles, diphtheria, and polio. This enviable record suggests that an emphasis on primary and preventive care pays handsome health dividends.[74]

A key to the success of the barefoot doctors is that they are chosen by their fellow peasants. They are trained during the agricultural slack season, never leave their villages for any extended period of time, and continue in their non-medical jobs. They do not view themselves as professionals and thus do not lose contact with their patients. In this way, it is hoped they can better understand their neighbors' medical complaints. Health care is not a separate discipline in China. It is woven into the existing social and economic fabric at the grassroots level. This participatory approach to health services could be a model for the world.

Nowhere is there a health care system comparable to China's. Fortunately, some nations have similar combinations of government commitment and local involvement in bringing better medical care to a broad spectrum of people. Tanzania's efforts are representative of what an extremely poor country can accomplish. As in most developing nations, life expectancy is low and the infant mortality rate is high. Nine out of ten people live in rural areas and suffer the litany of diseases—measles, pneumonia, gastroenteritis—that usually kill only the poor. Rural primary health care is of paramount importance.

As part of a bootstrap development effort, the Tanzanian Government established a number of Ujamaa communal villages, each with a health post or dispensary. This initial link in the health care chain treats minor ailments and gives first-aid care for more serious illnesses. More importantly, the posts provide a core around which preventive health care campaigns can be organized to clean up sewage or to rid the community of house flies. These posts are staffed by medical helpers, selected and supported by their fellow villagers, who receive an intensive six-month course in primary care. While Tanzania is a long way from having adequate health care, its initial efforts to decentralize health care planning and delivery point the way for other developing countries.[73]

A similar effort, with some measured results, was launched in Cuba in the early sixties. The number of rural health clinics and hospitals has increased dramatically since then. Many neighborhoods now have health workers with only minimal training—local students, housewives, or retired women—who check hygiene, diet, and minor illnesses of children and pregnant women. The results are encouraging. Maternal and infant mortality has decreased; deaths from gastroenteritis, tuberculosis, and measles fell by nearly 80 percent between 1962 and 1973. While the overall economic and social development of Cuba during this period certainly accounts for some of this improvement, neighborhood health care has played an important role.[74]

New initiatives to bring better medicine to more people, backing up and complementing a renewed emphasis on self-care, can mean major improvements in overall health. The role of individuals in this effort is a controversial one. Smokers and the obese often claim the right to die in their own fashion. Others believe that changing habits or improving the environment is irrelevant because everyone has to die of something. Such rationalizations, however, beg the question: the economic and social costs of individual poor health are borne by the entire society.

Other observers, however, argue that because the sources of illness and disease are frequently beyond immediate personal control, suggestions of individual responsibility for health really blame the victim. To be sure, self-care and collective efforts to change personal behav-

ior and to institute public policies promoting health can be frustrated by powerful interests, like the tobacco or chemical industries, that give a low priority to the health problems caused by their products. Ensuring a healthier environment and better access to medical care will require the redistribution of power and resources within society. This difficult process can begin through people changing life-styles and involving themselves in self-care and preventive health campaigns. Such efforts can provide immediate health results and, when linked to broader social goals, can also teach participants about the economic and political obstacles to better health.

The growing interest in the decentralization of medical services and the involvement of individuals as active participants in health care are logical responses to the unmet demand for health services, rising medical costs, and the new understanding of the sources of disease. While even the best primary, preventive, and self-health care cannot ensure that every child will live to the ripe old age of Methuselah, increasing the individual's and the community's roles in health care brings the goal of longer and healthier lives for many people within humanity's grasp.

The Consumer As Energy Producer

Self-reliance has become the touchstone of national and local energy policies. Energy consumers, whether countries or individuals, are assessing how they can best become producers of more of the energy they need. The most effective way to increase national and personal energy self-reliance is through conservation measures and the use of solar energy—from sunlight, wind, water, and green plants. These long-neglected energy sources are sustainable, efficient, socially manageable, and available at the local level. Their use normally depends on small-scale technologies that involve the energy consumer directly. Local energy self-reliance can make individuals and communities less vulnerable to energy price rises and supply shortages and can become the basis of greater national energy independence.

The last quarter of this century marks the end of an energy era, with world petroleum production expected to peak in the nineties. Eco-

"Long-neglected energy sources are sustainable, efficient, socially manageable, and available at the local level."

nomic development fueled by oil becomes a questionable benefit in both industrial and agrarian societies when it brings with it dependence on oil imports and growing balance of payments problems. The future of coal is limited, despite vast remaining reserves, because it pollutes the air when it is burned and ruins the land when it is mined. For some time, it was expected that nuclear power would replace petroleum as the world's major source of energy. During the seventies, however, rising costs of commercial reactors, doubts about nuclear waste disposal and uranium availability, and growing public opposition to plant siting have shown that expectations for nuclear power are pipe dreams.

Dependence on nonrenewable energy resources and energy imports has made both rich and poor societies vulnerable to price fluctuations and supply interruptions. Another problem has also emerged—dependence on a centralized, national energy system. In 1976, for example, the U.S. Federal Power Commission reported 35 major power failures and thousands of minor ones affecting millions of people. While all energy systems are subject to failure—whether through sabotage or acts of nature—centralized sources are particularly vulnerable.[77]

Large-scale electrical generating facilities and the movement of oil or natural gas between global and national regions also concentrate political and economic power. In the winter of 1977, many factories in the American Northeast and Midwest closed temporarily, throwing thousands out of work, because the national market for heating fuel favored industrial consumers in fuel-producing states. Without indigenous power sources, local communities have few energy options. Their lack of control over this influence on the local economy can translate into increased inflation and unemployment, and a lack of dynamism in the local business and social community. The major electricity grids and regional energy interdependecies emerged because they were supposedly more efficient and effective. While this has generally been the case, the social and economic costs of these centralized energy systems were not anticipated.

The problems of the current major energy sources—petroleum, coal, nuclear power—and of centralized facilities have led people to reas-

sess the most effective ways to meet energy needs. The most abundant, safest, and most efficient sources of energy are waste energy and solar power in its various forms. Some of the most startling savings through conservation will be realized in advanced industrial societies and some of the simplest and most elegant applications of solar energy will be seen in rural Third World settings. Yet, there is room for conservation measures in developing nations, where traditional cooking methods can often be supplanted by more efficient stoves. Similarly, renewable energy resources can meet many of the industrial and home energy needs in North America, Europe, and Japan.

A unit of energy saved is usually more valuable than one produced. National governments and international agencies can encourage energy saving, but most conservation must take place at local and individual levels. Taxes on fuel and levies on automobile size are useful tools for steering citizens into desired consumption patterns. Experience has unfortunately shown however, that until a conservation ethic is widespread and people find energy saving in their own interest, energy profligate behavior will continue despite marginal increases in cost and inconvenience.

The amount of energy conservation possible in all societies has only begun to be measured. The United States wastes fully half the energy it consumes. Much of it is spent foolishly on a poorly designed transportation system—on cars that weigh too much, engines that get poor mileage, and freight that goes by truck when it could go more efficiently by rail. Additional energy is wasted on housing. Building designs are more often shaped by the architect's whim that by external climatic realities. Simple conservation measures are often overlooked. More than four out of five homes surveyed in one Washington, D.C. low-income neighborhood had no storm windows, and more than half had no ceiling insulation. All this excess U.S. consumption surpasses the amount of commercial energy used by two-thirds of humanity. Even if it was affordable, such abuse of nonrenewable energy resources is unconscionable.[78]

While energy waste is far less in developing countries, savings can still be made. Many families cook over open fires or on inefficient

stoves, where much of the heat is lost. Arjun Makhijani, an Indian energy analyst, has estimated that nearly twice as much energy is used for such cooking in the Third World as is normally used by American stoves and ovens.[79]

A great deal of energy can be conserved if government policy, industry practice, and personal habits are all geared to using energy efficiently. The Germans, the Swiss, and the Swedes use only one-half to two-thirds as much energy as Americans and yet enjoy comparable life-styles. West German homes are smaller than American ones, and homeowners often leave bedrooms unheated to conserve energy. In some areas of Sweden, surplus heat from electricity production and industrial processes is captured and converted to steam to warm neighborhood homes. Swedes also insulate their homes better than Americans do, resulting in an average heat loss estimated to be half that in the United States. These are current energy savings. They reflect higher energy prices, some government incentives, and, above all, an individual and community concern for efficient energy use that is sadly lacking in much of the industrial world.[80]

Yet there are some signs of change in the United States. By 1977, largely through individual initiatives, more than 80 percent of American homes had some amount of insulation, compared with 62 percent only two years earlier. A number of cities have instituted cooperative insulation programs to make the homes of the poor and the elderly more energy-efficient. There are proposals to make private and public capital available at discount rates so that individuals will insulate their homes themselves. There is renewed interest in the traditional regional architecture that takes advantage of the natural insulation properties of local building materials and that sites houses to capture solar energy for heating and cooling. Small cars are becoming more popular, although American preferences are not yet the most energy-conscious. In fact, the recent failure to conserve energy in private transportation underscores the reality that individual conservation initiatives alone will not suffice to overcome the problems of an energy-short world.[81]

Energy conservation efforts can only succeed when they are backed by political leadership. The city government of Davis, California

has encouraged local energy conservation since 1968—through changing building codes, buying more buses, building bicycle paths, and supporting recycling. Few national governments, however, have given energy conservation the high priority it deserves. One that has, Sweden, spent nearly $1 billion in grants and loans between 1974 and 1977 to encourage more efficient energy use by individuals, industries, and municipalities. The equivalent U.S. expenditure, adjusted for population size, would be $27 billion. Certainly a large sum, but the alternative is an even greater investment in developing new energy supplies.[82]

Solar power, like conservation, is well-suited to community and individual control. It is abundant—more sunlight reaches the earth each day than humanity uses commercially from all other sources in a year. More importantly, the technologies to use this resource are available today.[83]

Solar technology is diverse and flexible, enabling its users to tap solar energy supplies efficiently and to match their availability with local needs. It capitalizes on poor countries' most abundant resources—sunlight and green plants. Solar devices can often be fashioned from local materials: a few barrels filled with water on a roof make an adequate solar heater in warm sunny climates. Solar water and space heaters and many windmills bring out the best qualities of ingenious tinkerers, who can adapt them to individual needs.

These natural and technological advantages suggest a greater local involvement in harnessing solar energy than has been possible with any other energy source. For reasons of economics, the current oil-based, centralized energy economy almost demands lockstep participation through advertising and mildly coercive rate structures. For reasons of safety, a nuclear energy economy must be even more authoritarian, with police-state security to protect fuel and nuclear wastes. But in a solar-based society, most social controls could melt away. Such "power to the people" is not just a play on words, for consumer energy production involves a transfer of both technical and political power. As each family and community gains some added measure of control over a previously complex and arcane aspect of their lives, they acquire knowledge and self-assurance that can help

"All the homes in New Hampshire could be outfitted with solar water heaters for the price of one nuclear reactor."

them manage other social and economic problems. The potential for even greater dependence on renewable energy resources at the local level portends important political and social changes.

The simplest use of solar power is heating with direct sunlight. Through simple design changes, individual builders can adapt homes to local climatic conditions and available building materials, saving homeowners up to 50 percent on heating bills. Active solar heating systems, which trap the sunlight's heat in water or stone and store it for use, are being employed in diverse localities. The town of Mejannes-le-Clap in France has announced plans to obtain most of its heat from the sun. Saudi Arabia plans to use the sun to heat and cool a large residential section of the new town of Jubail. The Solar Energy Industries Association estimated there were 133 solar-heated homes in the United States in 1975 and 5,000 of them by the end of 1977.[84]

Solar water heating is now widespread in some countries. More than two million Japanese and 30,000 Australian families rely on solar water heaters. Two hundred thousand Israeli households—a fifth of the country's total—use solar-heated water to bathe or to wash their dishes. No oil embargo, soaring fuel bills, or depletion of oil reserves will interrupt their supply of hot water. The best place to use the sun's free energy to heat water is often on individual rooftops. This is an affordable project. All the homes in New Hampshire, for example, could be outfitted with solar water heaters for the price of one nuclear reactor.[85]

There are many energy needs, however, that require electricity. Fortunately, solar (or photovoltaic) cells—which directly convert the sun's rays into electricity—can meet much of this demand at the local level, eliminating the need to increase the number of centralized electricity generating plants. Manufacturing costs for solar cells, long a drawback to their use, are dropping dramatically. The U.S. Department of Energy now expects price reductions before the end of the century to make solar cells economically competitive with other forms of electrical generation for the homeowner.[86]

Solar cells are modular by nature and little is to be gained by grouping them at a single collection site. The technology is most sensibly

applied in a decentralized fashion—on individual rooftops or in small neighborhood collection units—to minimize transmission and storage problems. Used in this manner, solar technology can enable individual consumers to break the monopoly over electrical power held by the public and private utilities.

Falling water is another solar energy source that can generate electricity. While engineers have long focused on large hydroelectric plants, much small-scale hydropower has yet to be exploited along streams and irrigation ditches. Small plants are more efficient and less environmentally disruptive than large hydropower facilities. About 37 percent of China's electricity comes from water power; estimates suggest as much as one-fifth of this comes from small plants. According to some observers, there were 15,000 small hydropower stations in operation in China in 1968 and over 60,000 by 1975. Such plants are built almost entirely with local resources. Even the electrical generating equipment is sometimes made locally, with many communes producing their own turbines and generators. While the amount of power generated in each location is often small, sometimes the result of water falling only a few feet, it can provide electricity to run light industry close to the plant. This local production and use of hydropower is an efficient, economical process that is socially consistent with the Chinese system of local responsibility for the solution of many problems, part of their national push for self-reliance.[87]

Other parts of the world are only now beginning to realize the potential contribution of small-scale hydropower. A recent U.S. survey conducted by the Army Corps of Engineers identified nearly 50,000 potential hydropower sites, small dams built for agricultural or flood control purposes. The power these dams could generate would exceed that currently produced by U.S. nuclear plants. The environmental and economic costs of fitting them with generators would be low compared with the price of new dams. Such small dams could diversify the supply of energy, making the centralized systems they feed into less vulnerable. Finally, in planning new hydropower development, the political and economic dominance of a community by a hydropower utility, as happened with the U.S. Tennessee Valley Authority, could be avoided by using small-scale facilities.[88]

The time-tested windmill has been resuscitated as a useful way to tap solar power. While large windmills have been experimented with, they have experienced severe mechanical problems and have proven quite costly. Small mills, on the other hand, are more efficient and can operate in low winds. They are technically simple and relatively inexpensive. They lend themselves to local control and can be adapted to such immediate energy needs as grinding flour or running irrigation pumps.

Local communities, like the Gelebs in rural Ethiopia, are turning to wind power. Because of limited rainfall, the Gelebs scratched out a meager existence for generations, subsisting on the food produced during one short growing season. With the help of American missionaries, who introduced windmills of a design long used in Crete, the Gelebs have begun to pump underground water for irrigation. The windmills are cheaper to build than more technically advanced models from developed countries and they pump twice as much water in the same wind. Their use means the Gelebs have year-round cultivation and a better chance of avoiding future food shortages.[89]

While the Gelebs use windmills to generate power that could not easily be obtained in other ways, a group of ambitious renovators in New York's Lower East Side are using a windmill on the roof of their tenement to lower their fuel bills and to symbolize their energy independence. Their small windmill generates only two kilowatts of power—barely enough to light the halls and the basement and to pump water through solar panels on the roof. But during a 1977 blackout, the tenement's lights shone like lonely beacons, advertising the only wind-generated power in New York City. When the windmill generates more electricity than the occupants need, the surplus is fed into the city's electrical grid. The amount is small, but reversing the meter establishes the important principle that decentralized production is able not only to meet individual energy needs but to produce some energy for the community as well. For years, some industries have been selling their excess power to utilities in their area. Now, individual homeowners who generate electricity may be able to do the same thing.[90]

Solar power that is captured and stored in green plants is a renewable source of energy that is also well-suited to local control. To better manage dwindling firewood supplies, some communities in the Third
48 World are organizing and protecting local woodlots and starting tree plantations. Fast-growing trees, to be grown along roadways or in small private plots, are being developed; these offer encouraging opportunities for individuals and neighborhoods to build a sustainable firewood supply. In many South Korean villages, local Forestry Associations have been formed to plant and maintain woodlots and to organize the cutting and sale of wood. While the associations receive some government financial and technical assistance, the villagers run the program and benefit from the woodlots. By 1977, some two million acres of trees had been planted by these local groups.[91]

Such initiatives are not limited to the Third World. Half the houses in Vermont now use wood for at least some of their heating. Finland and Sweden get 14 and 7 percent of their respective energy budgets from wood, mostly from pulp and paper industry waste. The U.S. Department of Energy estimates that properly managed forest harvesting could provide New England with a sustainable source of energy equivalent to the output of several nuclear plants or to millions of barrels of imported oil. Firewood, the most traditional of fuels, has a glowing future as an individual and local energy source that can help some nations become more energy self-reliant.[92]

When organic matter decays in the absence of oxygen, it generates methane gas. Controlled fermentation of both plant and animal waste in biogas plants can produce methane suitable as a replacement for natural gas. The plants take waste of negligible value and turn it into usable energy and a high quality fertilizer. The first attempt to introduce widespread use of biogas was in India in the forties. The gobar gas project—named for the Hindi word for cow dung—has been slow to get off the ground. By 1976, less than 25,000 small plants were in operation. By contrast, biogas plants are widely used in the villages of China. In May 1977, the New China News Agency reported 4.3 million working units, many of them communal plants producing enough gas to meet the needs of up to 50 people. Recent reports indicate that 17 million peasants use biogas for cooking, heating, and lighting in Szechwan Province alone.[93]

"Solar technologies cannot change the inequitous social structures that often block individual and community efforts to solve problems."

The Chinese biogas system demonstrates the advantages of biogas plants in low-income rural areas where there is a willingness to use local labor and materials to produce energy. Several families working together can provide themselves with gas and fertilizer from their own wastes. Where communities have a tradition of working together to solve problems, biogas plants can be an agent of local development. The lack of such a tradition in India may account for the slower adoption of biogas plants there. In many cases the Indian plants benefit the elites who have always controlled the local society. Without equal access to the plant and animal wastes fed into the biogas plants, the poor cannot benefit equitably from the energy produced. As with other solar technologies, biogas plants offer only a means to self-help and community betterment. They cannot, in and of themselves, change the repressive and inequitous social structures that often block individual and community efforts to solve problems.

Green plants can also be grown specifically as "energy crops" to further national energy independence. In late 1975, Brazil launched an ambitious program to reduce the country's dependence on imported petroleum through the distillation of cassava and sugar cane into alcohol for automobile use. By mid-1977, service stations in Sao Paulo and Rio de Janeiro were selling a mixture of gasoline and alcohol. Greater production of cassava and sugar cane will be required to meet the national goal of replacing 20 percent of gasoline with alcohol by 1981. The government has yet to decide whether to favor intensive cultivation of these crops on plantations or on small landholdings. Support for small farm production would ensure that many of the economic benefits of increased national energy self-reliance are equitably distributed.[94]

While most solar technologies are basically simple and already in wide use today, energy transitions take time. Some solar applications are novel and people everywhere are rightly suspicious of new technologies until they have mastered them. Adoption of solar technologies may be slow because the consumer only indirectly experiences the vulnerability of dependence on nonrenewable energy resources through price rises and periodic shortages. The initial capital costs and maintenance problems of solar technologies affect the individual

consumer directly and may dull his or her enthusiasm despite the long-term advantages of solar power.

50 The potential for widespread use of all forms of solar energy is reflected in the growing public dissatisfaction with traditional, highly centralized energy production. Citizen protest movements have virtually halted nuclear power plant construction in Germany. Public opposition to plant sitings has delayed the construction of nuclear and oil-fired plants in a number of U.S. localities. Through "Lifeline" campaigns, consumer groups have attempted to force utility companies to charge individuals lower rates for the energy used to meet basic needs. In such activities, citizen groups have begun to question who should determine energy policy and how energy should be produced and distributed.

As citizens insist on more of a say in shaping energy policy, governments will have an opportunity to help individuals meet more of their own energy needs. By funding research on a variety of solar technologies to give consumers numerous options, by facilitating access to the capital needed locally to get the solar transition started, and by giving political support to conservation initiatives, governments can go a long way toward marshalling the human energy needed to tap these renewable energy sources.

Such efforts will transfer new political and economic power to individuals and their communities. As the consumer becomes an energy producer, the energy portion of family expenditures, which in recent years has been on an inflationary spiral, could begin to stabilize. As communities become more energy self-reliant, their economies will be less susceptible to disruptions caused by fuel shortages and rising prices. This energy independence will translate into the political power that comes from individually and collectively meeting a basic human need. With local energy self-reliance as its primary building block, national energy self-reliance—providing some relief from the debts and vulnerability associated with energy imports—will become a possibility.

Most future energy needs can be best met by capturing waste energy and by harnessing locally the numerous forms of solar power. Be-

cause tapping both these energy sources requires the continual participation of individual consumers, the transition to locally controlled, highly differentiated energy sources will unalterably remold society. As in possibly no other area of human endeavor, today's local responses to the global energy problem will profoundly affect the social and political structure for years to come.

Conclusion

The growing evidence of the success of local efforts in meeting human needs raises several questions. If people are often best at solving their own problems, why do these problems still exist? If the poor are best at building their own housing, why are housing conditions still so unacceptable? Why do the problems facing both the rich and the poor seem to be growing ever larger and more unmanageable? Doesn't the recent interest in local problem solving only suggest that when all else fails, people are thrown back on their own resources and they muddle through, much as they always have?

The answers to these questions lie in the nature of human beings, the ability of people to work together, and the ultimate tractability of their problems. The historical landscape is dotted with the ruins of grand social experiments based on naive and simplistic assumptions about the innate good qualities of men and women. People are considerably more capable and responsible than paternalistic stereotypes would suggest, but they are also less virtuous and wise than many would like to assume. For this reason, isolated self-help efforts, without the support of the community, have failed in the past. Individuals often narrowly define their own interests and fail to recognize that the roots of their problems lie within society at large. Political and economic power structures attempt to keep people from working together. Unless individuals affected by major problems can join with others in mutual self-help, basic human needs may go unmet.

Yet human and social foibles are not the only reasons that current global problems are so difficult to solve. The quantity and quality of food, housing, energy, and health needs are historically unique. Unprecedented resource scarcities, population growth, and deteriorating

biological systems have redefined the scope of humanity's most pressing problems and the appropriate responses to them.

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During the past decade, there has been a growing awareness of the global nature of many commonly shared problems. Neither rich and poor countries nor the rich and poor within countries have avoided housing shortages and poor health care. Rising food and energy prices in one nation have often been the result of actions taken halfway around the world. This growing interdependence led to increasing interest in transnational problem solving. Ever higher levels of national and international authority have been created to solve problems once handled exclusively at the local level. When efforts to meet human needs have been stymied in communities, responsibility for the task has often passed to the next higher level of authority—in the hope that there would be a better chance of success. The commonality of problems and their international character led to the fallacious assumption that problems can be solved removed from those most affected by them.

A World Bank study in August 1977 unwittingly highlighted the difficulties in any international effort to meet basic human needs. The estimated price tag for solving humanity's most pressing problems was staggering, despite an assumption of considerable local participation in all efforts. The average annual cost of upgrading services to meet food, water, housing, health, and education needs between 1980 and 2000 was projected to be at least $47.1 billion. These figures are for national and international expenditures, but only in developing countries. A true global cost figure, considering energy problems and the unmet human needs in industrial countries, would be much higher.[95]

World Bank analysts concluded that Third World governments will never be able to raise this capital themselves and that the success of efforts to solve these problems depends upon large financial transfers from rich to poor nations. The international community will not play this role. In 1975, total public and private official development assistance through bilateral and multilateral channels totaled $18.4 billion, not even enough to meet yearly basic housing needs according to the Bank estimate. The political will does not exist to solve prob-

lems through a large transfer of resources. Any development strategy based on the assumption that the rich will more than double their foreign aid is doomed to failure.[96]

This does not mean that foreign aid should be abandoned. But if the resources to fully meet basic needs are not forthcoming from national and international sources, then they must come from communities and individuals. While ready capital is scarce at this level, there is a reserve of labor and ingenuity that money cannot buy. Mobilization of local resources and the participation of those most affected by problems can go a long way toward alleviating the burdens of poverty.

Greater local responsibility for problem solving suggests a new facilitating role for international agencies and national governments. Public policy should respond to the expressed needs of the community rather than impose preconceived notions of what communities and individuals should want. Only the people faced with a range of problems can decide which ones have priority. National governments and international agencies should involve themselves in projects with high levels of local participation because these programs are most likely to reflect the real concerns of the poor.

To the extent possible, government funding should be channeled through organizations that truly have their roots in the local community. Nonrepresentative governmental bodies should be bypassed in favor of cooperatives and other participatory organizations. The Inter-American Foundation is an excellent example of this practice. Between 1971 and 1976, the Foundation disbursed $40 million of AID funds to citizens' groups in Latin America. None of these grants and loans went to foreign governments; the funds went directly to poor people who wished to help themselves. By the standard criteria set up to measure foreign aid, the Inter-American Foundation's programs are a success. In a number of projects, agricultural productivity has increased, houses have been built, and local level development has occurred. Loan repayment rates are as good as or better than those in other foreign aid programs. More importantly, the Foundation funds social processes through which individuals and commun-

ities not only solve their problems but also gain skills and a confidence that will benefit them long after specific development projects have ended.[97]

Beyond providing money, central authority can lead the way toward greater local responsibility for problem solving by not attempting to do things individuals and communities can best do for themselves. In the United States, individuals may live longer, healthier lives by changing their eating habits and getting more exercise, rather than by increasing government funding of medical care. In Britain, the problem of high food prices may be managed best not by further reliance on imports, but by new encouragement of small farmers and gardeners whose production can act as a damper on food price inflation.

At the international level, governments and agencies should consult and share information, yet basic needs can't be met by ponderous international bureaucracies. The World Health Organization (WHO), faced with the monumental task of eradicating smallpox, soon came to this conclusion. Their smallpox campaign was largely successful, although spending only $96 million over 12 years, because the program relied on individuals and communities to identify and isolate smallpox carriers. This major health problem was solved at the local level; WHO merely provided the technical and financial backup.[98]

Decentralizing the responsibility for problem solving will not undermine the authority of central governments. Where highly centralized administrations—in China, Cuba, Indonesia, South Korea, Taiwan, and Tanzania—have supported and even encouraged local initiative, the central government has not lost power and local communities have gained cohesion and self-reliance. Strong central governments have established broad social goals while facilitating local initiative—by underscoring the importance of private plot agriculture in China, or by emphasizing community-controlled family planning in Indonesia. Such political support, coordination of activities, and provision of limited financing is crucial for the success of disparate self-help projects. But centralized, paternalistic attempts to help the disadvantaged no longer have a place. With appropriate help, individuals and communities can work out their own best solutions.

It is unlikely that even the most prescient could accurately predict the nature of these various local solutions. They will emerge through a series of problem-solving experiences with a number of different issues. Through this process, men and women will gain a broader understanding of the causes of their difficulties and will acquire the administrative and organizational skills to better cope with their immediate and long-term needs in a pragmatic manner.

To be sure, public policies that have seemed equally appropriate in the past have foundered, as new dilemmas and unforeseen difficulties arose. Local responses to global problems will certainly be no exception to this historical experience. Fortunately, locally-based, participatory efforts are flexible by nature. Pragmatic, pluralistic initiatives promise to stand the test of time better than centralized, dogmatic, social reform efforts. In a rapidly changing world, the resilience of a local problem-solving strategy may be its most important asset.

The recent success of efforts at the local level gives reason for cautious optimism. Individuals and communities have slowly begun to reassert themselves in solving their food, housing, health, and energy problems. In this participatory process, some of the most pressing human needs are being met.

Notes

1. This material is documented in other parts of the paper.

2. For further material on participation in development see John M. Cohen and Norman Uphoff, *Rural Development Participation: Concepts and Measures for Project Design, Implementation and Evaluation* (Ithaca, N.Y.: Cornell University, Center for International Studies, January 1977) and Norman Uphoff and Milton J. Esman, *Local Organization for Rural Development in Asia* (Ithaca, N.Y.: Cornell University, Center for International Studies, November 1974).

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